

**Minutes of the Research Directorate Meeting
Held on January 18, 2002, at Argonne National Laboratory**

Attendees:

APS Attendees:

S. Davey, R. Gerig, M. Gibson, B. Glagola, D. Mills, T. Rauchas, S. Strasser, R. Torres, and M. Vigliocco-Hagen.

Other Attendees:

M. Beno, M. Capel, J. Chrzas, D. Cookson, E. Crozier, B. Fischetti, B. Hartline, D. Keane, L. Keefe, R. Klaffky, and D. Robinson.

CAT Directors/Alternates:

T. Chiang, R. Clarke, J. Crabb, K. D'Amico, E. Gluskin, A. Goldman, T. Gog, A. Howard, T. Irving, A. Joachimiak, L. Lurio, D. Mao, J. Quintana, G. Rosenbaum, C. Segre, E. Stern, J. Viccaro, R. Winans, and P. Zschack.

Murray Gibson introduced Beverly Hartline, Deputy Director of Argonne National Laboratory. She welcomed the attendees and spoke briefly of the importance of the APS and its user community to Argonne National Laboratory.

Routine Business:

The minutes of the October 9, 2001, Research Directorate meeting were approved as written. Susan Strasser reviewed the contents of the packets and the agenda items. Kevin D'Amico requested that the subject of time and materials be added to the agenda for discussion. There were no action items from the last meeting.

APS Updates and Reports/Discussion Items:

APS Update:

Dr. Gibson presented an update of the status of the APS. Budgetary issues were discussed, along with the constraints that have been placed upon the APS and the user community during this fiscal year. Dr. Gibson will be attending a budgetary meeting in Washington, D.C., on February 21, 2002.

The APS is still awaiting the written recommendations from the DOE Review conducted in October 2001. In their oral closeout, the review group was very positive about the machine and its operation. The outside perception that the APS is a "closed shop" must be looked at closely. It was also emphasized that there should be more support for users.

Future planning issues were also discussed. Dr. Gibson presented a draft APS mission statement and goals. Attendees were asked to review these drafts and offer input.

Dr. Gibson informed the group that an APS/user retreat is being planned for May 15-17, 2002, in Lake Geneva, Wisconsin. There will be approximately 40 APS representatives in attendance. Gibson has suggested to CAT Directors that each send two representatives (one from the scientific community and one from the technical arena). Members of the APSUO Steering Committee were also invited to attend. Reasonable expenses will be covered by the APS.

A critical issue is the need to improve communication and partnership between the APS and users. Tools that are currently being used or planned to enhance this partnership are the retreat in May, CAT Director and user one-on-one discussions, CAT Chats, and TWG Meetings. Members were asked to identify other methods that could be used in the future.

Another very important issue identified by Gibson is user support. Potential new areas for this support are CAT liaisons, computer support, a detector pool, optics development, and enhanced biology expertise within the APS. Members were also asked to identify additional areas where user support could be improved.

The Independent Investigator program is very important for the APS. A task force will be formed to evaluate this program and offer improvements to the present situation. Attendees were asked to suggest users to serve on this task force.

Operational Update:

Tony Rauchas gave the group an operational update. Thus far in FY2002, the APS is at 96.6% of beam availability. During FY2001, availability was 95.8%.

Three user runs and three maintenance periods are planned for FY2003. The runs are scheduled for early October through mid December, late January through mid April, and late May through late August. User operation hours are planned at 5080 hours, with 75% of those hours being at low emittance top-up mode. Other potential improvements for FY2003 include further optimized emittance/coupling, higher peak current, and higher single bunch current.

Beam position limit detectors (BLPDs) are protection circuits that ensure that the stored beam orbit through the insertion devices (ID) is not mis-steered, which would cause ID photon radiation to strike storage ring components. In order to optimize the photon trajectory in the beamlines, the storage ring orbit in some sectors is close to the BPLD limits. The low-emittance lattice requires a non-zero dispersion in the ID straight sections. Minor variations in voltage cause minor changes in energy, resulting in position changes through the IDs. Changes in orbits are detected by BLPDs, causing beam trips. The corrective action for this situation is to bring the orbit back to the center of the vacuum chamber. This action will minimize BPLD beam trips and provide a larger dynamic aperture with improved injection efficiency and improved lifetime. However,

this action may impact the CATs by requiring the beamline components being realigned to reestablish optimum transmission. Currently, a proposal/plan for this action is being prepared for presentation to the CATs.

The contractor for the HP-CAT experimental stations (Fabcast) will be returning on February 18 to finish its remaining construction, which will require approximately 12 weeks. Since local union labor was not being employed in this endeavor, the millwrights union set up pickets at the Fabcast gates and observers at all other ANL gates. Other construction trades did not cross the observer line, therefore stopping construction activities at ANL. An election is scheduled for February 22, 2002, for Fabcast workers to see if they wish to join the union.

Review of High-Current Workshop:

Denny Mills summarized the recent workshop on higher currents at the APS. An excellent turnout (68 attendees) indicated that this is a topic of great interest to APS users. In regard to increasing currents, going to 130-150 mA may be a reasonable first step, because there is little cost to the accelerator and front ends associated with such an increase. A test of higher current operation during machine studies will be conducted prior to the May retreat. Results of these tests will be discussed at that time. APS will be distributing a list of options for increasing brilliance at the APS together with a description of the tradeoffs for each option. CATs will be asked to examine the impact of each option on their beamlines/science and prepare a written response to the APS in advance of the retreat.

CCRP/PEB Reviews:

Susan Strasser outlined the agendas for the upcoming reviews: the APS Construction/Commissioning Review Panel meeting on February 21-22, 2002 and the Program Evaluation Board Meeting on February 27, 28 and March 1, 2002. Strasser asked that all materials be sent to her electronically by February 6, 2002.

CAT Operational Funding:

Dr. Gibson informed the group about potential new options for CAT operational funding and reiterated the challenge that will be faced this year relative to obtaining funding. These changes are very important both to the CATs and the APS, and while they offer improved operational stability and support, they must be managed carefully. CATs that are likely to be affected will be notified and invited to participate in early discussions with the APS on how to handle this change. Pat Dehmer, Iran Thomas and Pedro Montano have been invited to the next Research Directorate meeting to answer questions on this issue. Pat has already confirmed that she will come.

Independent Investigator Program Task Force:

Dr. Gibson talked about the very important issue of the Independent Investigator Program at the APS. There is a great need for user involvement in formulating and setting policies. A task force will be formed to look into this program. This task force will be formulated relatively quickly, possibly prior to Dr. Gibson's budget meeting in Washington, D.C., on February 21, 2002.

LOM Parking:

Jim Vicarro, CARS-CAT, expressed concern about the lack of parking space in the 434 area. Other CATs expressed the same concern during the discussion. A report on this issue will be presented at the next Research Directorate Meeting.

Time and Materials:

Kevin D'Amico, SGX-CAT, asked if the problems the CATs are experiencing with time and materials contractors could be looked into so that a more effective and efficient process could be put into place in order to get the work done. CATs would like to have more control regarding vendor selection. APS management will look into this issue and report progress made at the next Research Directorate Meeting.

APSUO Vice-Chair Election:

Paul Zschack announced to the group that Steve Durbin was elected to the APSUO Vice-Chair position.

CAT Updates:

BESSRC-CAT:

On January 1, 2002 all five stations became available to Independent Investigators, with the addition of 11-ID-D. BESSRC-CAT is finalizing plans for installation of two additional mirrors in 12-ID, which will allow pink beam operation. This installation should be complete in the next six months.

Two new papers in *Physical Review Letters* are coming out from work at BESSRC-CAT.

1. Antiferroresistive Reconstruction of the PbTiO₃ (001) Surface, A. Munkholm, S.K. Streiffer, M.V. Ramana Murty, J.A. Eastman, Carol Thompson, O. Auciello, L. Thompson, J.F. Moore, G.B. Stephenson, *Physical Review Letters*, 88, No. 1, 016101-1 to 016101-4, Jan, 2002
2. Momentum-Resolved Charge Excitations in a One Dimensional Prototype Mott Insulator, M.Z. Hasan, P.A. Montano, E.D. Isaacs, Z-X Shen, H. Eisaki, S.K. Sinha, Z. Islam, N. Motoyama, S. Uchida, *Physical Review Letters*, 2002 in press.

Bio-CAT:

Staffing:

Bio-CAT has two new beamline scientists, Dr. David Gore and Dr. Raul Barrea.

SAXS Facility Operational: During the last six months, Bio-CAT has been developing its macromolecular solution scattering facility to a point where it can be a routine instrument for Rg and Pr measurements. These effort have been aided by significant improvements in the stability in the beam delivered by the APS and our optics, as well as

the excellent signal to noise characteristics of Bio-CAT's new CCD detector. This past fall, Bio-CAT hosted its first outside user group from Albert Einstein. Its next run is planned for February.

Cardiac Research: The cardiac muscle research program at Bio-CAT continues to be successful. A paper in this month's *Circulation Research* will necessitate a rethinking of the mechanism behind the so-called Frank Starling Law of the Heart, the major regulatory mechanism in the cardiac muscle.

Bent Laue analyzer for high energy edges: One of Bio-CAT's core research projects is development of a high energy bent laue analyzer for XAFS spectroscopy of those biologically relevant elements that are beyond the range of the multilayer analyzer. This novel device relies on thin silicon crystals bent to a logarithmic spiral shape to diffract the desired fluorescence radiation. The diffracted beam appears to emerge from a virtual source that is displaced from the real source of the scattered background (and fluorescence from other elements if present). Specifically, Bio-CAT is targeting two of the most biologically relevant elements: Molybdenum (K-edge 20 KeV) and Cadmium (K-edge 26.7 KeV). The Bio-CAT second monochromator with Si(400) crystals can reach up to 35 KeV. Bio-CAT has successfully used the Cadmium analyzer to collect data using focused undulator beam on Bio-CAT and achieved very good throughput and data quality.

Stopped-Flow for Time-Resolved XAFS: Another core project is the development of a stopped-flow apparatus for time-resolved XAFS. This device has been recently upgraded in several important aspects with a user-friendly software interface now taking shape. With these enhancements, repetitive continuous flow experiments can now be done with very different flow rates and sample volumes. The slowest rate tested so far is 0.05 microl/s with the fastest rate being 1000 micol/s. Rapid mixing can now be done routinely using a vortex mixer and a small observation cell. An on-line optical monitoring system can be optionally installed to track changes in the absorption spectrum over the visible range. Bio-CAT anticipates that continuous flow and fast scanning will find wide use for a large range of XAS experiments.

CARS-CAT:

Personnel: Jodi Canaday joined CARS-CAT this week as part of the administrative group here at Argonne. She will assist with University of Chicago administrative responsibilities, APS requirements, and user support as well.

Sector 13 – GSECARS: The GSECARS user program continues to be over subscribed at a rate of about 2 to 1. There have been 284 unique users since 1998 and 691 user visits.

The large KB mirrors installed on the undulator beamline are routinely operating with mono beam in user mode. The pair focuses ~90% of undulator beam to 55 microns horizontal x 11 microns vertical (FWHM) with $\sim 10^{13}$ photons/sec. Inelastic scattering

and grazing incidence XAFS experiments were performed successfully with this beam. The BM vertical mirror is focusing 3-mm down to 25-microns.

First acoustic experiments with 1000-ton multi-anvil press were successfully completed.

GSECARS is submitting a 5-yr competitive renewal proposal as a National Facility to the NSF in February 2002

Sector 14 – BioCARS: The NIH site visit is set for April 8, 2002, as part of the competitive renewal of operations of the sector.

Six time-resolved Laue proposals serviced last run, 3 of them non-CARS.

About 116 users came to BioCARS during the 2001-4 run; 36 external proposals were serviced.

Sector 15 - ChemMatCARS: Approximately 36 different users came to ChemMatCARS in 2001, either to participate in commissioning or data collection runs. ChemMatCARS publication list is growing.

A sample vacuum chamber for the SAXS was successfully commissioned and is now in regular use. Camera lengths can be changed in an almost automated way. SAXS runs with users have been productive. The remaining parasitic scattering for very-low-angle experiments is being tracked down.

The turn-key micro crystal diffraction instrumentation has been modified so that the unit can function as an 'instant' crystallography facility allowing for more efficient utilization of spare shifts and unforeseen beam availability. The facility will be part of the SCrAPS program at the APS.

Pre-user commissioning of the liquid surface spectrometer continues. All mechanical systems have met or exceeded specifications. Integration is expected to be completed early this year.

The time resolved crystallography project is moving forward. ChemMatCARS has received the Nd YAG laser, which was on loan to NSLS. And it is being integrated into the beamline. A Huber 5020-based diffractometer will be used for the experiments.

ChemMatCARS is preparing the conceptual design and scientific case for the buildout of the bending magnet beamline. The initial design work will be done with Oxford, Ltd. The planned submission of the proposal is summer 2002.

CMC-CAT:

COM-CAT:

DND-CAT:

DND-CAT continues to install instrumentation for the 5-BM-B beamline. In addition, DND-CAT has tested a commercial Kumakhov Lens on 5ID and has achieved a 120 micron spot with 30 percent efficiency. Senior DND staff are currently preparing the LS-CAT Management Plan. The first reports from independent investigators (IIs) on Sector 5 have been accepted for publication, and DND has started preallocating II time in its schedule so that IIs can be accommodated on short notice during the current run cycle.

HP-CAT:

Design/construction status: ID-A, ID-B and the A-B beam transport were radiation tested in November and in December, the latter after remediation of leaks by HP-CAT staff in order to proceed with the installation of instrumentation. The high heat-load slits and the double-crystal monochromator have been installed. The enclosure construction work will resume in mid-February by the remediation of the radiation leaks on ID-A and ID-B, followed by 12 weeks of round the clock shift work to complete the entire sector. Eighty percent of the instrumentation and components for ID-A have been delivered. The remainder is due to be delivered by the end of March. The crystal mounts and temporary crystals will be installed in the DCM in February. The experiment tables and small K-B mirror tables have been ordered for the entire sector. A pair of 30cm long K-B bimorph mirrors and two area detectors have been ordered for ID-B. Several ID and BM radiation and photon shutters have been delivered. Design work is continuing for the rest of the instrumentation. The sample preparation and beamline equipment assembly laboratories are equipped and in use. The current goal is to have ID-A and ID-B ready for beam commissioning in June 2002.

Personnel: A second post-doc has been recruited and a promotion to beamline scientist is expected after completion of a 6-months trial period. One more beamline scientist needs to be recruited, as well as two programmers/administrators (control-system and applications). The current number of full-time staff is nine, plus the four consultant engineers and drafters in the UK.

IMCA-CAT:

Staffing: John Chrzas is leaving IMCA-CAT this month to accept a position at SER-CAT, after more than six very productive years. IMCA-CAT is advertising for three positions: a sector scientist, a macromolecular crystallographer, and a support technologist. Inquiries from qualified candidates will be welcome.

Equipment: On 17-ID, the Area Detector Systems Corp. Quantum 210 detector system operated during all of 2002-1. There have been some growing pains in using the system, but in general it has been effective.

On 17-BM, the replacement of two springs in the mount for the sagittal bender for the second crystal in the monochromator has enabled a much stabler system. 17-BM is now a productive facility, and the fluence is high enough that several users have chosen to attenuate the beam for crystallographic experiments.

Science: Users completed many multiwavelength structures and dozens of difference-Fourier structures on 17-ID and 17-BM during 2002-1.

IMCA-CAT continues to file more ESAFs per sector than any other CAT. Occasional use of the "FedEx" model for data collection has proven effective.

The Independent Investigator Program on 17-ID is running smoothly, with approximate balance between time allotted and time requested. The first *Science* publication arising from our II program has appeared.

Upcoming: IMCA-CAT is reorganizing the staffing model in preparation for the hires mentioned above. After 2002-2, IMCA-CAT will install an upgrade to the 17-ID monochromator that will provide for fixed offset, a wider energy range, and higher fluence due to sagittal focusing. After 2002-3, IMCA-CAT will upgrade the 17-BM optics by installing a collimating mirror upstream of the monochromator and moving the focusing mirror from the experimental hutch to the FOE.

The IMCA-CAT board is close to finalizing the purchase of a commercial sample-loading robotics system, ACTOR, from Rigaku/MSU. This system should be operational this summer and will provide a significant increase in user throughput, especially for the kinds of experiments in which the IMCA-CAT companies specialize.

IMM-CAT:

IMM-CAT has recently added a number of new scientific collaborators, among them Professor Young Lee at the Massachusetts Institute of Technology and Professor Robert Leheny at Johns Hopkins University. Former beamline scientist Larry Lurio has joined the faculty of the Physics Department at Northern Illinois University and will be maintaining his connection with IMM-CAT as a member of the management board. Dr. Markus Schwoerer-Böhning has joined IMM-CAT as beamline scientist.

The coherent scattering program has recently succeeded in the application of XPCS to a number of new systems and methodologies. IMM-CAT has applied XPCS to the surface scattering regime in experiments measuring diffusion coefficients in thin homo-polymer films and di-block co-polymer films. The equilibrium fluctuations in a Fe₃Al binary alloy

were measured using a new coherence geometry that employs zone-plate optics to optimize coherence. IMM-CAT is also commissioning a high speed, direct detection CCD camera, optimized for performing full frame correlations at millisecond time-scales.

IMM-CAT expects to complete the beamline construction phase with the commissioning of our monochromatic side-station shutter during this January's run. The new shutter will allow operations in the diamond-fed side station to run simultaneously with the transmitted beam in the end station. Previously, both stations shared a single shutter. In addition, the new side station shutter is designed so that only two polished, high-purity, Be windows lie between the sample and the undulator source. This is critical for XPCS experiments in order to minimize the loss of coherence from windows. The design and construction of this new shutter would not have been possible without the support of Pat Den Hartog's group at the APS and in particular the engineering work of Bran Brajuskovic. IMM-CAT is now operational and has begun accepting independent investigator proposals. The IMM-CAT Bending Magnet Line has been spun-off under separate administration by NE-CAT.

MHATT-CAT:

Research continues in a number of focus areas including ultrafast diffraction at 7ID-D. A *Search and Discovery* article on our work at Sector 7 will appear in next month's *Physics Today*, highlighting the Bragg switch results that were recently reported in *Nature*. In the area of photon correlation spectroscopy, MHATT-CAT has developed a new method of investigating the internal dynamics of viscoelastic materials by embedding iron nanoparticles and manipulating them *in-situ*, in a magnetic field. This is a collaboration with the Ford Motor Company. In the microbeam area, scientists at Lucent have been imaging the dynamics of ferroelectric domains in periodically poled samples. We are also using the coherent Bragg Rod Analysis (COBRA) technique developed at MHATT-CAT to study interfacial ferroelectricity in $\text{BaTiO}_3/\text{SrTiO}_3$ and $\text{PbTiO}_3/\text{SrTiO}_3$ heterostructures in collaboration with PNC-CAT and BESSRC-CAT.

Other new work during this cycle includes the use of microfluorescence to study trace elements in magmatic rock samples. This involves a team of geologists who had no previous exposure to SR measurements. Thanks to Geo-CARS staff for its help. MHATT-CAT added a new beamline scientist in November 2001.

MR-CAT:

MR-CAT has had six IIs at this point, one selected through submission full proposal and five through quick access mode. MR-CAT is asking all of them to submit full proposals during this cycle.

MR-CAT will begin FOE construction for the BM line within the next few months thanks to a monochromator that has been donated to MR-CAT.

The search for an open beamline scientist position is nearly finished. MR-CAT had 25 candidates and hopes to complete the hire within the next few weeks. A new resident user, who is also a part-time user support person, has joined MR-CAT. This individual is an IIT postdoctoral appointee.

MR-CAT funding renewal proposal will be submitted in July 2002.

Scientific highlights include successful fluorescence mapping of magnetite in pigeon brains and fluorescence EXAFS from self-assembled L-R films.

MR-CAT is now very comfortable with the high resolution diffraction set up. It will be used extensively during the current run. Implementation of continuous scanning with this technique promises to allow the beginning of in-site experiments and the reduction of scanning time.

MU-CAT:

PNC-CAT:

There has been no change in staffing since the last Research Directorate meeting.

The ID line continues to be fully operational, and Independent Investigators and new members are being scheduled on this line. The bending magnet line is being commissioned with expectation that commissioning will end in June, at which time the bending magnet line will become operational.

The biggest uncertainty at the moment is in regard to funding because of the plans of the DOE to transfer operational funding for PNC-CAT to the APS for administration. Discussions are ongoing now to set up procedures to implement this transfer.

SBC-CAT:

Dr. Marianne Cuff has accepted the SBC-CAT offer on a crystallographer/user support position. She will participate in the user program of SBC-CAT and research activities of the Midwest Center for Structural GenomiX (MCSG). Michelle Ficner has returned from maternity leave.

In December 2001, 19BM beamline was declared operational. Therefore both 19ID and 19BM are fully operational. During the next run, 19 groups are scheduled to collect data on 19ID and 17 on 19BM.

On 19ID, the monochromator is being upgraded with a new design Si111 first and second crystal. On 19BM, the CCD detector is being scheduled for upgrade (new CCDs and electronics) in May. The Canberra fluorescence detector is operational on 19ID. The Oxford cryocooler is being upgraded by the APS, and SBC-CAT is running with a spare unit provided by the APS. SBC-CAT wishes to thank the APS people who have helped.

In the past three months, there were three papers published in *Cell* (ribosomal subunits, clamp loader complex of *E. coli* DNA polymerase III) and one in *Nature* (cover, complexes of ribosomal subunits with antibiotics) using data collected at the SBC-CAT. Several MAD structures have been solved by members of MCSG including SurE and spermidine synthase.

Accomplishments: In FY2001 SB-CAT hosted >90 user groups, and >300 users. SBC-CAT members and users published 48+ publications.

SER-CAT:

ID-Beamline: Measurements of the vertical beam profiles with slit sizes of 10 μm have not shown the fine fingered structures with large intensity variations that were measured at 19-ID and which have been attributed to phase interferences. Intensity fluctuations measured vs. time are very small (about 0.5% rms) and change very little with slit size and sampling time, which shows that there no phase interference problems. The reason is probably a much better finish of the first monochromator crystal.

The endstation instrumentation installation has been completed.

A prototype of the Bruker Proteum 300 detector has been tested, and SER-CAT is waiting now for the final version of the detector, including a new version of the software, for the acceptance tests.

BM beamline:

- White beam transport and the movable shields at the hutch feedthroughs have been installed.
- Most support structures have been installed.
- The installation of endstation instrumentation has started.
- The installation of the front end has been started by the APS and will be completed during the May shutdown.
- All BM-hutches are ready for validation.

Personnel: In response to the advertising of job openings for Director of Operations and a Macromolecular Crystallographer, a number of applications were received. John Chrzas has been selected as Director of Operations. He has accepted and joined SER-CAT on January 15, 2002. Two crystallographers have been selected and will join SER-CAT in February and April depending on the time needed for the hiring process.

SGX-CAT:

SGX-CAT succeeded in beginning commissioning of the 31-ID beamline on December 11 on schedule. SGX-CAT was able to perform calibration experiments, as well as work on real SGX crystals and obtained data to solve a novel structure. Many thanks to all the APS personnel who helped make this a success. Commissioning work will continue during the upcoming run.

SRI-CAT:

Sector 1:

A Bruker SMART 6500 CCD area detector has been delivered and will be incorporated into the sector 1 experimental programs, in particular the high-energy program.

Sector 2:

A parallel computer cluster at beamline 2-BM is fully integrated into the microtomography data acquisition system. It now processes data at rates >150 GB per day and can reconstruct a 1024-cubed data set in less than 6 min.

New intermediate energy and hard x-ray zone plates have been fabricated in gold with finest zone widths down to 110 nm and thicknesses up to 1.3 microns.

X-ray diffraction has been observed from a single, 150 nm x 30 nm SnO₂ “nanoribbon” object demonstrating the capability of x-ray microdiffraction for nanoscale materials using the high flux density microfocus beam at the 2-ID-D station.

Sector 3:

A joint experiment has been conducted to characterize medium-energy resolution inelastic x-ray scattering analyzers. Researchers from Spring-8, ESRF, APS and DELTA conducted the test. A total of nine analyzers produced with different preparation methods were characterized in terms of their energy width and reflectivity.

Coherent nuclear resonant scattering with circularly polarized light is used to measure spin flip in Fe/Cr bilayers, as a function of depth and magnetic field for the first time.

Sector 4:

For the first time, switching of the circularly polarized undulator was achieved. Switching from one helicity to another in a matter of minutes is now being accomplished. Pending further machine studies, the next step is to reduce switching time to several seconds.

UNI-CAT:

UNI-CAT continues to operate a comfortably oversubscribed Independent Investigator Program on our Sector 33 Undulator beamline. The largest demand for beamtime from the II segment of the UNI-CAT User community is in the area of Ultra-Small X-ray Scattering, but there are additional requests for access to powder diffraction, diffuse scattering, and thin-film diffraction capabilities as well.

Efforts to further commission the Sector 33 Bending Magnet beamline are underway. This includes fabrication of new crystals for topography and plans to commission our sagittal crystal bender that accepts 5 mRad and focuses in either experimental hutch. Both symmetric and asymmetric crystal pairs will be provided for topography.

To support the topography program at UNI-CAT, construction of a conventional photographic darkroom facility is about to start. This facility will be located on the Experiment Hall floor in Sector 33. Once constructed, competent users are invited to apply to use this facility to further support their scientific needs.

In Sector 34, UNI-CAT continues to commission both the microbeam and coherent scattering stations. Sharing the undulator spectrum for both has only occasionally been a nuisance, and both experiments routinely accept beam simultaneously. However, beam stability continues to be a difficult issue. Beam motions of as little as 1 urad cause unacceptable changes to the spectrum for white beam diffraction. Steering the beam significantly off-axis and tapering the undulator have helped reduce the problem, but a permanent solution is still under development. The double crystal monochromator for the coherent diffraction facility has arrived and will be commissioned during the upcoming operations period. This is a small offset, water-cooled diamond crystal monochromator that will permit monochromatic as well as pink beam capability in the coherent scattering station.

Action Items:

For CAT Directors:

1. Provide input to the APS on the draft APS mission statement and goals. Send input to S. Strasser. (all CAT Directors)
2. Identify areas for improved APS/CAT/user communication; send ideas to S. Strasser for submission to the User Retreat Planning Committee. (all CAT Directors)
3. Report to D. Mills the best times for higher current studies. (all CAT Directors)

For the APS:

1. Report on plans to address LOM parking issues at next Research Directorate meeting. (Murray Gibson)

2. Appoint a committee to plan the agenda for the May APS/User Retreat. (APS management in consultation with Paul Zschack)
3. Address issues related to time and materials contracts and report progress at next Research Directorate meeting. (APS management)
4. Address implementation of Experiment Safety Approval Form changes (in particular, the inclusion of CAT-specific information on form) and report progress at next Research Directorate meeting. (APS management)
5. Identify and notify CATs affected by new DOE operational funding paradigm. (S. Strasser)

Next Meeting:

The next Research Directorate Meeting will be held on April 12, 2002.